

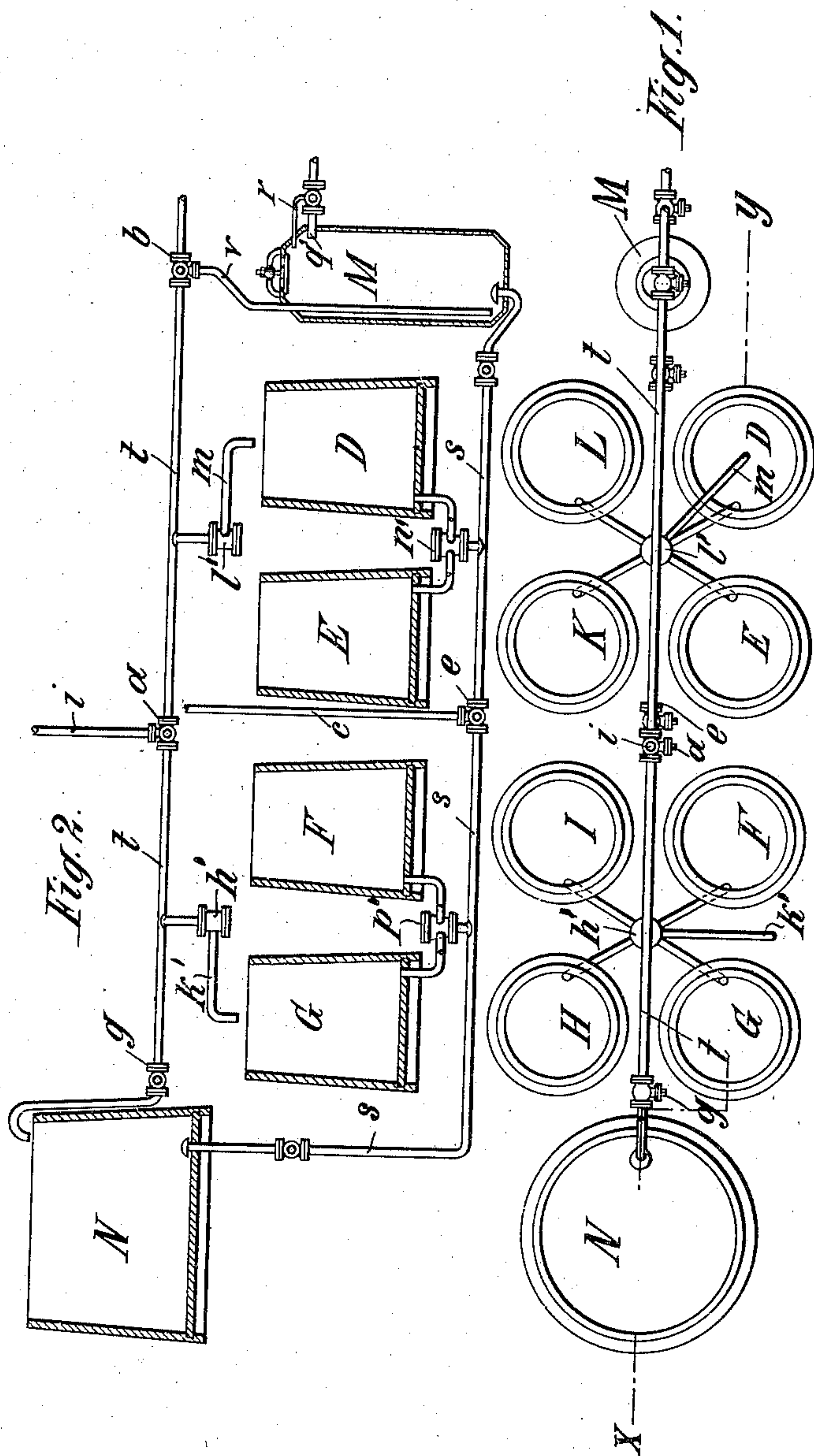
No. 662,896

C. J. M. FLEETWOOD.
TANNING APPARATUS.

Patented Nov. 27, 1900.

(No Model.)

2 Sheets—Sheet 1.



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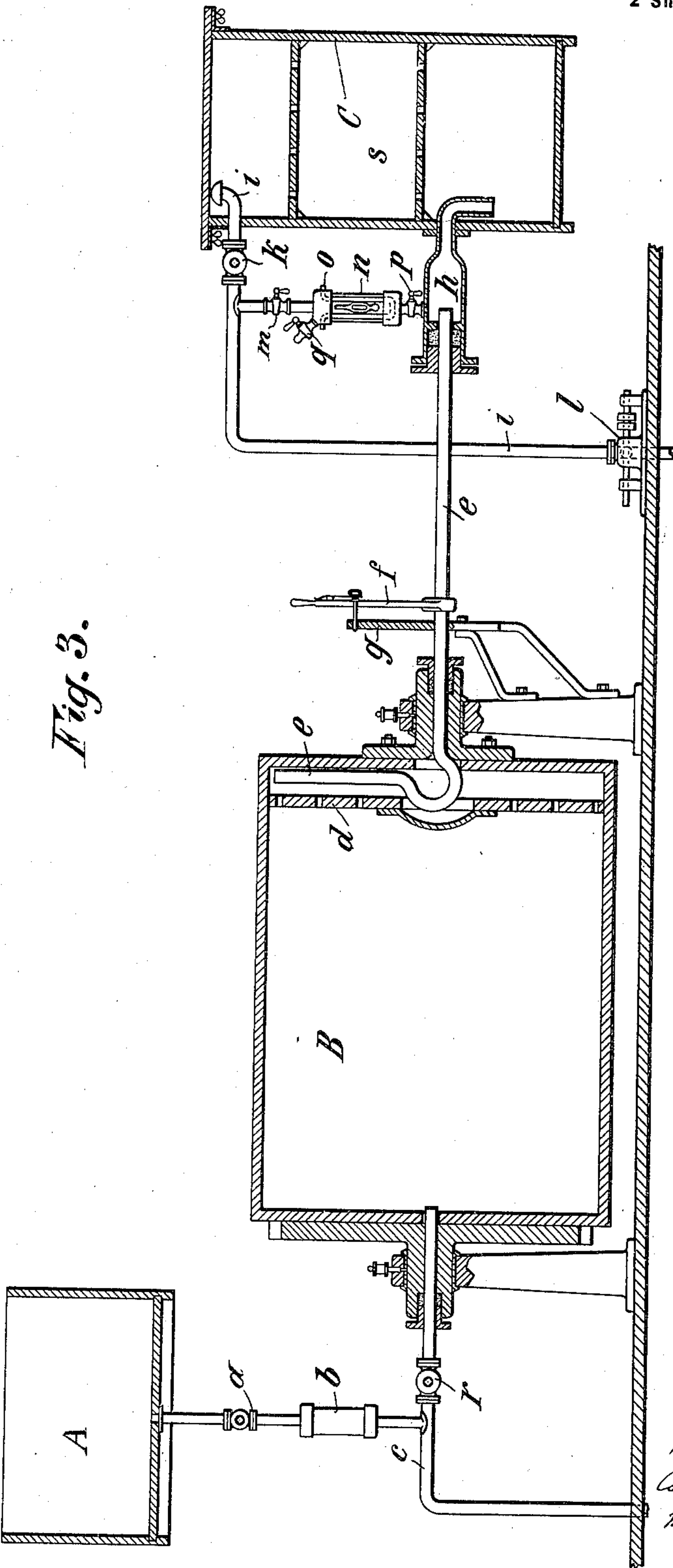
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(Application filed Nov. 20, 1899.)

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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

CARL JOSEF MILES FLEETWOOD, OF FREIBERG, GERMANY.

TANNING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 662,896, dated November 27, 1900.

Application filed November 20, 1899. Serial No. 737,625. (No model.)

To all whom it may concern:

Be it known that I, CARL JOSEF MILES FLEETWOOD, engineer, a subject of the King of Sweden and Norway, residing at Freiberg, in the Kingdom of Saxony and Empire of Germany, have invented certain new and useful Improvements in Apparatus for Accelerating the Process of Tanning and for the Complete Utilization of Tanning that has been Once Used, of which the following is a full, clear, and exact description.

The present invention relates to an apparatus by means of which the tanning liquor which has been once used can be continuously regenerated, a saving effected in the quantity used, and the quantity can be constantly regulated and tested and also can be led for the purpose of purification constantly through a heap of purifying material—such as spent tan, &c.—and by producing a rarefaction of the air in the chamber the penetration of the tanning liquor into the pores of the hides can be accelerated. It is important to regulate the quantity of the tanning liquor contained in the tanning-drum, because as a small quantity of hides will of course absorb much less tanning liquor in the tanning process than a larger quantity of hides a considerable saving in the tanning liquor can be effected by regulating the amount of the liquor. In order that the tanning liquor shall properly penetrate the hide, it is indispensably necessary that the said liquor shall be as clear and clean as possible. If it contains foreign substances, the latter become deposited in the pores of the hide and prevent the tanning liquor from penetrating the hide. This latter drawback is one of the greatest disadvantages of the present rapid-tanning process, because a liquor which has been once used contains such a large quantity of impurities due to detached or dissolved fibers of the hides that with each new charge of hides either a part of the liquor must be renewed or the whole of the liquor must be completely purified. Now the apparatus forming the subject of this invention has the advantage that the liquor comes in a continually-purified state upon the hides. This has the advantage that the said liquor can be completely utilized, while in addition to the saving effected thereby a determined formation of acid is

produced, which, as every tanner knows, is a great advantage. With this apparatus it is also possible to measure and to vary, as desired, the concentration of the liquor during the tanning process. This has been already attempted in recent times by adding new liquor and then regulating the concentration by means of the hides to be tanned; but this process has the great disadvantage that the tanning liquor varies irregularly and depends on the hides. The pores of the interstices of the hides in their untanned state are of course filled with air, and this fact renders the tanning process more difficult because the liquor is compelled to displace the air before it can penetrate the hide. Now in the new apparatus a partial vacuum is produced in the tanning-drum, whereby the tanning process is accelerated, because the pores of the hides being filled with rarefied air oppose very much less resistance to penetration by the tanning liquor.

The apparatus hereinbefore described is illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view thereof in part. Fig. 2 is a sectional elevation of the same on the line *x y* of Fig. 1. Fig. 3 is also a sectional elevation of the other part of the apparatus.

A is a vessel which serves to receive the extract of the tanning agent. The extract coming from the vessel passes through the valve *a* and the glass vessel *b*, which serves for inspection of the flow of extract into the pipe *c*.

B is the drum in which the tanning operation is effected. It has a perforated partition *d*, which has the object of protecting the pipe *e*. The pipe *e* discharges on the right hand of the partition *d*, and the said pipe can be rotated by means of the lever *f* independently of the rotation of the drum. This lever *f* can be placed and kept fixed in any position by means of the holder *g*. The pipe *e* opens on the other side with an air-tight seal or joint into the pipe *h*, which in its turn opens into the lower part of the vat C. This vat is divided by two perforated heads into three compartments, the central one of which is filled with (spent) tan or any other material that serves to filter the liquor. From the upper part of the vat C the pipe *t* leads through the

valve *k* to the rotary pump *l* and farther on to any desired number of receiving-vats, which are as deep as possible, preferably of a depth of six meters, and from which the pipe
 5 *c* leads into the drum B. When the hides have been thrown into the drum B, the opening of the pipe *e* is placed at the height at which it is desired that the level of the liquor in B shall stand. Then the pump *l* is oper-
 10 ated and pumps up the liquor from the vats. This liquor passes through the pipe *c*, receives the extract from A, then passes through the valve *r*, which serves to connect the drum B with the outer atmosphere when it is to be
 15 discharged into the drum B. From here the liquor passes through the pipes *e* and *h* into the lower part of the vat C. By the action of the pump *l* a partial vacuum is formed in the upper part of the vat C, causing the liquor
 20 to rise through the filtering material and out through pipe *i* to the receiving-vats shown in Fig. 2.

n is a test-glass communicating with pipes *i* and *h* by means of short pipes provided with
 25 cocks or valves *m* and *p*, the test-glass being provided with a petcock *q* for outlet of air, a pipe *o* passing in U shape through the glass and open to the air at each end, and any form of instruments for testing the temperature
 30 and specific gravity of the liquor, as at *n'*.

To test the liquor as it comes through pipe *i* from the filter, the valve *p* is closed, the petcock *q* opened, and the valve *m* opened until a sufficient quantity of liquor to test has
 35 run into the glass *n*, when the valve *m* is closed. The liquor in the glass is then tested by an aerometer and thermometer, and afterward the glass *n* is emptied into pipe *h* by opening the cock or valve *p*. Air circulating
 40 through pipe *o* will cool the liquor in the glass *n*. In large establishments several apparatus and drums, as shown in Fig. 1, may be used. Then the discharge-pipe *i* serves also as a feed-pipe for the next drum. The dis-
 45 charge-pipe of the last drum in this case is connected with the pump.

M is an extractor connected with the steam-pipe *q'*, which has a branch *r* for forcing over.

D E F G H I K L are vats for receiving the
 50 liquor.

N is a vat which is intended to convert alkaline liquor by the addition of acid-tan into acid liquor.

p' and *n'* are four-way cocks. *l'* and *h'* are
 55 also such cocks. The two latter are connected with the rotary pipes *k'* and *m*.

The weakest liquor passes from D through the valve *n'*, pipe S, valve *e*, and pipe *c* to the drum and passes from thence through the
 60 pump and the pipe *i*, valve *a*, pipe *t*, valve *g* to the vat N, and is therein converted into acid liquor. The liquor from E takes the same course as far as the valve *a*; but from there it is caused to pass through pipe *t*,
 65 valve *l'*, and rotary pipe *m* into the vat D. In this manner the liquor passes from F into E, from G into F, H into G, J into H, and K into

I. The liquor from L after having taken the path as far as the valve *a* passes through the pipe *t*, valve *b*, and pipe *v* into the extractor
 70 M, where it is concentrated by boiling, and then it is forced over for the purpose of the formation of acid into the vat N, which has already been emptied of the liquor that has
 75 come from D. It then flows subsequently as acid liquor into the vat K.

What I claim, and desire to secure by Letters Patent, is—

1. In a tanning apparatus, the combination with a rotary tanning-drum, of a liquor-
 80 outlet pipe leading therefrom and adjustable independently of the drum, a filter in communication with the drum by means of said pipe, a testing-chamber communicating with
 85 said pipe, and a pump for drawing the liquor from the tanning-drum and through the filter, substantially as described.

2. In a tanning apparatus, the combination of a rotary drum, a liquor-outlet pipe,
 90 with one end arranged therein, means to effect the movement or adjustment of said pipe independently of said drum, and a receptacle or vat adapted to contain filtering material, having communication with said pipe
 95 and an outlet-pipe for said vat or receptacle, connecting with a testing device and a pump for delivering the liquor thus purified or regenerated to the required destination, substantially as specified.

3. In a tanning apparatus, the combination of a rotary drum, means to supply the
 100 same with the tanning liquor, a separately movable or adjustable pipe with one end arranged interiorly of said drum, a vat or receptacle adapted to contain a filtering material, an air-tight pipe or nozzle connecting
 105 the aforesaid pipe and vat, an outlet-pipe for said vat connecting with a pump to deliver the liquor to required additional vats or vessels, substantially as described. 110

4. In a tanning apparatus, a rotary drum, a means for the supply of the liquor thereto, a
 115 separately movable or adjustable pipe, with one end arranged interiorly of said drum, an air-tight chamber or pipe communicating with said pipe, a receptacle or vat to contain a filtering material, an outlet-pipe for said
 120 vat, a testing device connected to said outlet-pipe, a pump connecting with said outlet-pipe, and a series or number of additional vats or vessels having pipe connections with said pump, substantially as set forth.

5. In a tanning apparatus, the combination of a rotary drum, means for the supply
 125 of the liquor thereto, a separately movable or adjustable pipe, with one end arranged within said drum, an air-tight chamber or pipe connecting with the aforesaid pipe, a vat or receptacle adapted to contain a filtering material and connected with said chamber, an
 130 outlet-pipe for said vat, a testing device connected with said outlet-pipe, a pump connected with said outlet-pipe, a series of additional vats or vessels having valved dis-

charge-pipes, an additional pipe connecting
with said discharge pipes and tanks, one at
each end thereof, and with a pipe connecting
with said rotary drum at its supply end and
5 further pipes additional to discharge into said
additional vats or vessels and into said end
tanks, substantially as specified.

In witness whereof I subscribe my signature in presence of two witnesses.

CARL JOSEF MILES FLEETWOOD.

Witnesses:

ALVESTO S. HOGUE,
AUGUST FUGGER.